

Remarks

Claims 1-20 are pending. Reconsideration of the application is requested.

§ 103 Rejections

Claims 1, 3, 6, 7, 11, and 13 are rejected under 35 USC § 103(a) as purportedly being unpatentable over Wolk et al. (US 6,214,520 B1) in view of Miyakawa et al. (US 7,201,969 B2). The Examiner's position is that Wolk discloses a method for manufacturing a semiconductor chip comprising applying a photothermal conversion layer, referred to as a light-to-heat conversion (LTHC) layer, that can convert light energy to heat energy. The Examiner points out that the LTHC layer comprises a light-absorbing agent (radiation absorber) that converts the radiation into heat to enable transfer of the transfer layer (heat decomposable resin) to the receptor (light-transmitting support). The Examiner's position is also that Wolk discloses preparing a semiconductor wafer by laminating the wafer, with a circuit face and LTHC layer facing each other, and irradiating light from the light-supporting side to cure the photocurable adhesive layer to have a non-circuit face on the outside. The Examiner's position is that irradiation energy decomposes the LTHC layer. The Examiner's position is that Miyakawa discloses these limitations in its method of manufacturing a semiconductor, the limitations including grinding the non-circuit face of the semiconductor wafer, dicing the ground semiconductor wafer from the non-circuit face side to cut it into a plurality of semiconductor chips and, optionally, removing the adhesive layer. The Examiner's position is that it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Miyakawa in the device of Wolk to produce a semiconductor wafer with an embedded integrated circuit that is then ground to the desired thickness and then diced to produce a plurality of semiconductor chips for use in hand-held information terminals, IC cards and the like.

Wolk describes a thermal transfer element for forming a multilayer device including a substrate and a multicomponent transfer unit that can be transferred to a receptor. In some instances the thermal transfer element also includes an LTHC layer. Transferring the multicomponent transfer unit to the receptor may include contacting a receptor with a thermal

transfer element having a substrate and a multicomponent transfer unit. The thermal transfer element is selectively heated to transfer the multicomponent transfer unit to the receptor.

Applicants' claim 1 is a method for producing a semiconductor chip that includes the step of preparing a semiconductor wafer having a circuit face with a circuit pattern and a non-circuit face on the side opposite said circuit face. The Examiner has not shown that Wolk teaches, describes, or suggests that a semiconductor wafer is prepared. The Examiner has pointed to col. 9, lines 6-23 [various thermal transfer elements] and col. 10, lines 5-11 [interlayer] and 28-32 [optional release layer] for support of semiconductor wafer preparation. Careful inspection does not appear to show any support of the preparation of a semiconductor wafer in the cited references.

Additionally Applicants' claim 1 requires that the photothermal conversion layer converts the radiation energy into heat and decomposes due to the heat. The Examiner has not shown that the photothermal conversion layer of Wolk (LTHC) is decomposed by the radiation energy converted to heat energy. The Applicants note that Wolk appears to expressly teach away from this element, for example, in col. 8, lines 39-41 where Wolk states "[i]n some instances, if the crosslinking of the LTHC layer is too low, the LTHC layer may be **damaged by the heat** and/or permit the transfer of a portion of the LTHC layer to the receptor with the transfer layer" (emphasis added). The Applicants interpret this to suggest that it is desirable that the heat **not** decompose the LTHC layer. The Examiner also has not shown that Wolk teaches, describes, or suggests a semiconductor wafer having a circuit face and non-circuit face. The Examiner has additionally not shown that Wolk teaches, describes, or suggests irradiating light from the light-transmitting support side to cure the photocurable adhesive layer. The Applicants also note that Wolk in col. 12, lines 20-24 states that "the adhesive layer may be formed using, for example, thermoplastic polymers" Thermoplastic polymers are not chemically reactive upon heating or radiation and thus Wolk expressly teaches away from a photocurable adhesive layer (which would be thermosetting instead of thermoplastic) or that the irradiating light cures the adhesive layer. The Examiner admits that Wolk does not teach a method for grinding a non-circuit face of the wafer, dicing the ground semiconductor wafer, or optionally removing the adhesive layer from the semiconductor chips. The Examiner's position is that Miyakawa teaches these elements missing from Wolk. Since the Examiner has not shown that Wolk teaches all of

the limitations of Applicants' claim 1 and also has not shown that Miyakawa adds all of the limitations of Applicants' claim 1 that are missing in Wolk, the Examiner has not made a *prima facie* case of obviousness. As such, the Applicants respectfully request that the Examiner withdraw the rejection of claim 1 over Wolk in view of Miyakawa.

Claims 3, 6, 7, 11, and 13 all depend upon claim 1 with all of its limitations. Since the Examiner has not made a *prima facie* case of obviousness of claim 1, likewise the Examiner has not made a *prima facie* case of obviousness for claims 3, 6, 7, 11 and 13. For at least these reasons, Applicants respectfully suggest that the rejections of claims 3, 6, 7, 11, and 13 over Wolk in view of Miyakawa are improper and should be withdrawn.

Claims 2, 4, 8, 12, and 14-20 are rejected under 35 USC § 103(a) as purportedly being unpatentable over Wolk et al. (US 6,214,520 B1) in view of Miyakawa et al. (US 7,201,969 B2) as applied to claim 1 above, and further in view of Oka (US 6,551,906 B2). The Examiner has suggested that Oka discloses the use of a die bonding tape that is affixed to the semiconducting wafer before dicing the ground wafer. Oka has not been shown to add the missing limitations of Wolk and Miyakawa discussed above for claim 1. Applicants' claims 2, 4, 8, 12 and 14-20 all depend upon claim 1 adding further limitations thereto. Thus, the Examiner has not made a *prima facie* case of obviousness with respect to claims 2, 4, 8, 12, and 14-20. The Applicants respectfully suggest that the Examiner's rejections of claims 2, 4, 8, 12, and 14-20 over Wolk in view of Miyakawa and further in view of Oka are improper and should be withdrawn.

Claims 5 and 9 are rejected under 35 USC § 103(a) as purportedly being unpatentable over Wolk et al. (US 6,214,520 B1) in view of Miyakawa et al. (US 7,201,969 B2) as applied to claim 1 above, and further in view of d'Aragona et al. (US 4,818,323). The Examiner suggests that d'Aragona discloses a method for producing a semiconductor chip wherein laminating the wafer is performed in a vacuum. The Examiner has not shown that d'Aragona describes, teaches, or suggests the limitations of Applicants' claim 1 that are absent from Wolk in view of Miyakawa. Claims 5 and 9 depend upon claim 1 and add further limitations thereto. Thus the Examiner has not made a *prima facie* case of obviousness for claims 5 and 9. The Applicants respectfully suggest that the rejections of claims 5 and 8 over Wolk in view of Miyakawa, and further in view of d'Aragona are improper and should be withdrawn.

Claim 10 is rejected under 35 USC § 103(a) as purportedly being unpatentable over Wolk et al. (US 6,214,520 B1) in view of Miyakawa et al. (US 7,201,969 B2) and Oka (US 6,551,906 B2) as applied to claim 4 above, and further in view of d'Aragona et al. (US 4,818,323). Since claim 10 ultimately depends upon claim 1 with all of its limitations and neither Oka nor d'Aragona add the missing limitations of Applicants' claim 1 to Wolk in view of Miyakawa as described above, the Examiner has not made a *prima facie* case of obviousness of claim 10. As such, the rejection of claim 10 over Wolk in view of Miyakawa and Oka as applied to claim 4 above, and further in view of d'Aragona is unwarranted and should be withdrawn.

Claims 2, 18, and 19 are rejected under 35 USC § 103(a) as purportedly being unpatentable over Wolk et al. (US 6,214,520 B1) in view of Miyakawa et al. (US 7,201,969 B2) as applied to claim 1 above, and further in view of Fukuoka et al. (US 6,939,741 B2). The Examiner has suggested that Fukuoka discloses the use of a die bonding tape, referred to as dicing tape, that is affixed to the semiconductor wafer before dicing the ground wafer. The Examiner has not shown that Fukuoka adds the limitations of Applicants' claim 1 that are missing from Wolk in view of Miyakawa. Claims 2, 18, and 19 all ultimately depend upon claim 1 with all of its limitations. Thus, the Examiner has not made a *prima facie* case of obviousness of claims 2, 18, and 19 as being unpatentable over Wolk in view of Miyakawa and further in view of Fukuoka. Thus, the rejection of claims 2, 18, and 19 over Wolk in view of Miyakawa and further in view of Fukuoka is unwarranted and should be withdrawn.

Claims 8 and 15-17 are rejected under 35 USC § 103(a) as purportedly being unpatentable over Wolk et al. (US 6,214,520 B1) in view of Miyakawa et al. (US 7,201,969 B2) as applied to claim 8 and 15-17 above, and further in view of Uchida (US 6,620,649 B2). The Examiner has suggested that Uchida discloses a method wherein the dicing of a semiconductor wafer is performed along scribe lines. As discussed above, Wolk in view of Miyakawa has not been shown to describe, teach, or suggest all of the limitations of Applicants' claim 1. Uchida has not been shown to add the missing features to Wolk and Miyakawa. Claims 8 and 15-17 ultimately depend upon claim 1 with all of its limitations. Thus, the Examiner has not made a *prima facie* case of obviousness of claims 8 and 15-17 over Wolk in view of Miyakawa and further in view of Uchida. As such, the rejection of claims 8 and 15-17 is unwarranted and should be withdrawn.

Claims 8 and 15-17 are rejected under 35 USC § 103(a) as purportedly being unpatentable over Wolk et al. (US 6,214,520 B1) in view of Miyakawa et al. (US 7,201,969 B2) as applied to claim 1 above, and further in view of Morita et al. (US 5,414,297). The Examiner has suggested that Morita discloses a method wherein the dicing of a semiconductor wafer is performed along scribe lines. Morita has not been shown to add the missing limitations to Wolk and Miyakawa. Claims 8 and 15-17 ultimately depend upon claim 1. Thus, the Examiner has not made a *prima facie* case of obviousness of claims 8 and 15-17 over Wolk in view of Miyakawa, and further in view of Morita. As such, the rejections of claims 8 and 15-17 are unwarranted and should be withdrawn.

Claim 20 is rejected under 35 USC § 103(a) as purportedly being unpatentable over Wolk et al. (US 6,214,520 B1) in view of Miyakawa et al. (US 7,201,969 B2) and Fukuoka et al. (US 6,939,741 B2) as applied to claim 2 above, and further in view of Uchida (US 6,620,649 B2). As discussed above, Wolk, Miyakawa, Fukuoka, and Uchida have not, in combination or alone, been shown to describe, teach, or suggest all of the limitations of Applicants' claim 1. Claim 20 depends upon claim 1, adding further features thereto. For at least all of the reasons given above, the Examiner has not made a *prima facie* case of obviousness of claim 20 over the above references. The rejection of claim 20 over Wolk in view of Miyakawa and Fukuoka, and further in view of Uchida is unwarranted and should be withdrawn.

In view of the above, it is submitted that the application is in condition for allowance. Examination and reconsideration of the application respectfully are requested.

Respectfully submitted,

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Office of Intellectual Property Counsel
3M Innovative Properties Company
Facsimile No.: 651-736-3833
DMH/SFW/spg

By: /Dean M. Harts/
Dean M. Harts, Reg. No.: 47,634
Telephone No.: 651-737-2325